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TITLE

A VIRTUAL REALITY METHOD

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a virtual reality(VR) method, and particularly to a virtual reality method in which users can build up a virtual reality system by directly adopting the images arranged in a matrix form.

Description of the Related Art

Conventionally, there are two methods to build up a virtual reality system. The first method is to photograph an object or the environment using a panoramic camera, so as to build up a virtual reality system. The second method is to establish the three-dimension(3D) digital information of an object or the environment so as to achieve the effect of virtual reality.

The first method requires a panoramic camera and related software(or plug-in software)for producing and playing the photos, and specific technical personnel to operate the camera and software. However, the panoramic camera and the software are expensive, and users always do not have time to learn the required skills. As a result, using the first method to build up a virtual reality system is unrealistic for general users.

On the other hand, since the 3D digital information of an object or the environment requires familiarity with a software

tool, such as AUTOCAD. For an art designer or marketing personnel, the time and money needed to learn the tool is also unrealistic.

SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide a virtual reality method in which users can build up a virtual reality system by adopting images arranged in a matrix form. In addition, the present invention also helps art designers or marketing personnel to design an interactive VR object or VR character by simple concept and operation.

To achieve the above object, the present invention provides a virtual reality method which operates with a different horizontal angle. First, a plurality of images are provided, and these images are connected in series as an image sequence. Then, a pointer pointed to a target-image in the image sequence is provided, wherein the target-image is one of the images in the image sequence. Finally, a direction signal is received, and the pointer points to an adjacent image next to the target-image when the direction signal is a first direction; and the pointer points to an adjacent image previous to the target-image when the direction signal is a second direction.

Furthermore, the present invention also provides a virtual reality method which operates with a different horizontal angle and a different overlooking angle. First, a plurality of images are provided, and these images are arranged into a matrix. Then, a pointer pointed to a target-image in the matrix is provided, wherein the target-image is one of the images in the matrix. Finally, a direction signal is received, and the pointer points to an adjacent image next to the target-image when the direction

signal is a first direction; the pointer points to an adjacent image previous to the target-image when the direction signal is a second direction; the pointer points to an adjacent image above the target-image when the direction signal is a third direction; and the pointer points to an adjacent image below the target-image when the direction signal is a fourth direction.

BRIEF DESCRIPTION OF THE DRAWINGS

The aforementioned objects, features and advantages of this invention will become apparent by referring to the following detailed description of the preferred embodiment with reference to the accompanying drawings, wherein:

Fig. 1 is a flow chart illustrating the operation of a virtual reality method according to the first embodiment of the present invention;

Fig. 2 is a schematic diagram showing an example photographing the images of an object from different horizontal angles as disclosed in the first embodiment;

Fig. 3 is a flow chart illustrating the operation of a virtual reality method according to the second embodiment of the present invention;

Fig. 4 is a schematic diagram showing an example photographing the images of an object from different horizontal angles and different overlooking angles as disclosed in the second embodiment; and

Fig. 5 is a schematic diagram showing an example of the image matrix in the second embodiment.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the accompanying figures, the preferred embodiments according to the present invention follow.

[First embodiment]

Fig. 1 illustrates the operation of a virtual reality method according to the first embodiment of the present invention, and Fig. 2 shows an example photographing the images of an object from different horizontal angles in the first embodiment. Referring to Fig. 1 and 2, the first embodiment of the present invention follows.

The first embodiment of the present invention represents a virtual reality method that operates with a different horizontal angle. First, in step S100, a plurality of images is provided, and these images are connected in series as an image sequence. These images are the photos of an object at different positions on a circle having a fixed radius, and there is a predetermined angle difference between one image and its adjacent image in the image sequence.

For example, referring to Fig. 2, the images described above are sixteen photos of an object 20 shot by a camera 30 at the different positions (1 to 16) on a circle, and the predetermined angle difference between two positions is 24 degree horizontal angle. The sixteen images are then connected in series as an image sequence.

In step S105, a pointer pointed to a target-image in the image sequence is provided, wherein the target-image is one of the images in the image sequence. In step S110, a direction signal is received. Then, in step S115, the direction signal's right/left orientation is determined.

If the direction signal is a right (namely the first direction) signal, then as in step S120, the pointer is verified

as pointing to the last image of the image sequence. If it is, then as step S125, the pointer is altered to point to the first image of the image sequence; If the pointer is not pointing to the last image of the image sequence, then as step S130, the pointer is altered to point to an adjacent image next to the target-image in the image sequence.

For example, if the direction signal is a right signal and the pointer is pointing to the third image of the sixteen images in Fig. 2, then the pointer is altered to point to the fourth image. If the direction signal is a right signal and the pointer is pointing to the sixteenth image of the sixteen images in Fig. 2, then the pointer is altered to point to the first image.

In step S155, the image indicated by the pointer is displayed, and the process returns to step S110, to receive another direction signal.

In addition, if the direction signal is not a right signal, then in step S135, the direction signal's right/left orientation is determined.

If the direction signal is a left (namely the second direction) signal, then as step S140, the pointer is verified as pointing to the first image of the image sequence. If it is, then as step S145, the pointer is altered to point to the last image of the image sequence; If the pointer is not pointing to the first image of the image sequence, then as step S150, the pointer is altered to point to an adjacent image previous to the target-image in the image sequence.

For example, if the direction signal is a left signal and the pointer is pointing to the third image of the sixteen images in Fig. 2, then the pointer is altered to point to the second image. If the direction signal is a left signal and the pointer

is pointing to the first image of the sixteen images in Fig. 2, then the pointer is altered to point to the sixteenth image.

Then, in step S155, the image pointed to by the pointer is displayed, and the process returns to step S110, to receive another direction signal.

As well, if the direction signal is not a left signal, the process goes directly to step S110, to receive another direction signal.

[Second embodiment]

Fig. 3 illustrates the operation of a virtual reality method according to the second embodiment of the present invention, and Fig. 4 shows an example photographing these images of an object from different horizontal angles and different overlooking angles. Referring to Fig. 3 and 4, the second embodiment of the present invention is described in detail as follows.

The second embodiment of the present invention represents a virtual reality method which operates with a different horizontal angle and a different overlooking angle. First, in step S200, a plurality of images are provided, and these images are arranged into a matrix.

These images are the photos of an object at different positions on a virtual spherical surface. The images in the same row of the matrix represent the images photographed from the same overlooking angle but a different horizontal angle, and there is a predetermined horizontal angle difference between one image and its adjacent image in any row. In addition, the images in the same column of the matrix represent the images photographed from the same horizontal angle but different overlooking angle,

and there is a predetermined overlooking angle difference between one image and its adjacent image in one column.

For example, referring to Fig. 4, the images described above are the photos of an object 20 shot by a camera 30 at the different positions on a virtual spherical surface. For example, at the position B of one predetermined overlooking angle, we can shoot sixteen photos of an object 20 using a camera 30 at the different positions (1 to 16) on a circle, and the predetermined horizontal angle difference between two positions is 24 degrees. The same situation exists for group A,B,C,…,and F. Therefore, there are 96 (6×16) images in this example, and these 96 images are arranged into a matrix 40, as shown in Fig. 5.

Then, in step S205, a pointer pointed to a target-image in the matrix 40 is provided, wherein the target-image is one of the images in the matrix 40. Also, in step S210, a direction signal is received. Then, in step S215, the direction signal's right/left orientation is determined.

If the direction signal is a right (namely the first direction) signal, then as step S220, the pointer is verified as pointing to the image in the last column of the matrix 40. If it is, then as step S225, the pointer is altered to point to the image in the first column of the matrix 40; If the pointer is not pointing to the image in the last column of the matrix 40, then as step S230, the pointer is altered to point to an adjacent image next to the target-image in the same row.

For example, if the direction signal is a right signal and the pointer is pointing to the third image of the sixteen images in row B of the matrix 40 in Fig. 5, the pointer is altered to

point to the fourth image in row B. If the direction signal is a right signal and the pointer is pointing to the sixteenth image of the sixteen images in row B of the matrix 40 in Fig. 5, then the pointer is altered to point to the first image in row B.

In step S295, the image pointed to by the pointer is displayed, and the process returns to step S210, to receive another direction signal.

In addition, if the direction signal is not a right signal, then in step S235, the direction signal's right/left orientation is determined.

If the direction signal is a left (namely the second direction) signal, then as step S240, the pointer is verified as pointing to the image in the first column of the matrix 40. If it is, then as step S245, the pointer is altered to point to the image in the last column of the matrix 40; If the pointer is not pointing to the image in the first column of the matrix 40, then as step S250, the pointer is altered to point to an adjacent image previous to the target-image in the same row.

For example, if the direction signal is a left signal and the pointer is pointing to the third image of the sixteen images in row B of the matrix 40 in Fig. 5, then the pointer is altered to point to the second image in row B. If the direction signal is a left signal and the pointer is pointing to the first image of the sixteen images in row B of the matrix 40 in Fig. 5, then the pointer is altered to point to the sixteenth image in row B.

Then, in step S295, the image pointed to by the pointer is displayed, and the process returns to step S210, to receive another direction signal.

Furthermore, if the direction signal is not a left signal, then in step S255, the direction signal is verified as being an up signal.

If the direction signal is an up (namely the third direction) signal, then as step S260, the pointer is verified as pointing to the image in the first row of the matrix 40. If it is, then as step S265, the pointer is altered to point to the image in the first row of the matrix 40; If the pointer is not pointing to the image in the first row of the matrix 40, then as step S270, the pointer is altered to point to an adjacent image above the target-image in the same column.

For example, if the direction signal is an up signal and the pointer is pointing to the third image of the sixteen images in row B of the matrix 40 in Fig. 5, then the pointer is altered to point to the third image in row A. If the direction signal is an up signal and the pointer is pointing to the third image of the sixteen images in row A of the matrix 40 in Fig. 5, then the pointer is altered to point to the third image in row A.

Then, in step S295, the image pointed to by the pointer is displayed, and the process returns to step S210, to receive another direction signal.

In addition, if the direction signal is not an up signal, then in step S275, the direction signal is verified as being a down signal.

If the direction signal is a down (namely the fourth direction) signal, then as step S280, the pointer is verified as pointing to the image in the last row of the matrix 40. If it is, then as step S285, the pointer is altered to point to the image in the last row of the matrix 40; If the pointer is not pointing to the image in the last row of the matrix 40, then as

step S290, the pointer is altered to point to an adjacent image below the target-image in the same column.

For example, if the direction signal is a down signal and the pointer is pointing to the third image of the sixteen images in row B of the matrix 40 in Fig. 5, then the pointer is altered to point to the third image in row C. If the direction signal is a down signal and the pointer is pointing to the third image of the sixteen images in row F of the matrix 40 in Fig. 5, then the pointer is altered to point to the third image in row F.

Then, in step S295, the image pointed to by the pointer is displayed, and the process returns to step S210, to receive another direction signal.

As well, if the direction signal is not a down signal, the process goes directly to step S110, to receive another direction signal.

As a result, users can photograph these images of an object or the environment and use a simple image editing tool, such as MS Paint, to connect or arrange these images into an image sequence or a matrix. Users can further utilize the image sequence and the matrix with the present invention to build up a virtual reality system. In addition, designers or marketing personnel can use the virtual reality method of the present invention to create interactive VR objects or VR characters with reduced learning time and expense.

Although the present invention has been described in its preferred embodiment, it is not intended to limit the invention to the precise embodiment disclosed herein. Those who are skilled in this technology can still make various alterations and modifications without departing from the scope and spirit of this invention. Therefore, the scope of the present invention

shall be defined and protected by the following claims and their equivalents.